

sac in fact show a condition intermediate between a well developed sperm and a naked sperm nucleus; and that this feature indicates the great age of chalazogams. These conclusions, which are practically the same as those given in the previous paper, are based upon a large amount of research and also upon a thorough discussion of the literature, in which the work of American investigators receives generous recognition. Both authors had already become identified with the subject, and no one has contributed more to our knowledge of chalazogamous plants than NAWASCHIN. Besides, as the discoverer of "double fertilization," he has made a reputation for brilliant initiative in research, while his more recent investigation of the sperm nucleus of *Lilium Martagon* entitles him to a place among the authorities in cytological matters. These facts lend weight to the conclusions. The paper deserves a careful reading by everyone who attempts to treat the phylogeny of angiosperms from a cytological standpoint. Three of the large plates are colored, and the fourth (copied from various investigators) gives a useful optical survey of pollen tube structures in various groups of gymnosperms and angiosperms.—CHARLES J. CHAMBERLAIN.

Cecidology.—Among the important foreign contributions is a purely botanical paper by BUYSSON and PIERRE,⁸ in which two species occurring on *Sedum* are discussed. HOUARD⁹ gives good descriptions of a number of cecidia in the Natural History Museum of Paris, restricting his discussions to the galls and not to the causes. KIEFFER¹⁰ describes two new genera and two new species of cecidomyid galls and gall-makers from Formosa.

Among the most interesting American contributions is a very suggestive paper on seedless and malformed fruits by BROWN,¹¹ in which the author, after discussing malformations and russetings caused by frost, also calls attention to the fact that fruits may be abnormal as a result of no pollination or imperfect pollination combined with frost injuries. After pollination, a severe frost may interfere with the fertilization processes and affect both seed and fruit. The author also states that there is relationship between weights of seeds and fruit but does not give figures.

FELT¹² contributes a very valuable entomological study of gall midges, in which he includes keys, descriptions, and drawings of a great many species.—MEL T. COOK.

⁸ BUYSSON, H. DU, et PIERRE, l'ABBE, Nouvelles cecidologiques du centre de la France. *Marcellia* 12:27-35. 1913.

⁹ HOUARD, C., Les collections cécidologiques du laboratoire d'entomologie du Museum d'histoire naturelle du Paris: Galles du Mavor. *Marcellia* 12:35-41. 1913.

¹⁰ KIEFFER, J. J., Description de deux remarquables cécidomyies de Formose. *Marcellia* 12:42-44. 1913.

¹¹ BROWN, F. R., Seedless and malformed fruits. Biennial Crop Pests and Horticultural Report for 1911 and 1912. Oregon Agric. Exp. Station.

¹² FELT, E. P., A study of gall midges. Twenty-eighth Report of the Entomologist of the State of New York. pp. 127-226. 1913.